

MONTHLY WEATHER REVIEW,

AUGUST, 1873.

WAR DEPARTMENT,

Office of the Chief Signal Officer,

DIVISION OF

TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE

The general meteorological conditions as determined from the observations taken at the stations of the Signal Service U. S. Army during the month of August, 1873, are indicated upon the accompanying maps.

In comparing these conditions with those of the corresponding period in previous years, the most noticeable features are—

1st. The excess of barometric pressure over New England and the Middle Atlantic States.

2nd. The diminution of temperature below the mean for the month of August in previous years, in the districts above named, and thence westward to include the Lower Lake region and the adjoining States.

3rd. The unusual quantity of rains in the Middle Atlantic District, especially near the coast.

The paths of the centres of the several areas of high barometer are traced on map No. 1.

These areas, with but one exception were first observed in British America, after which they moved with such uniformity, and became so unusually well defined as to render it possible to locate their centres at each of the tri-daily reports of this office from the time of their first appearance until they finally passed beyond the limits of observations.

The general direction of these paths while the areas remained central on the continent, is approximately from the northwest to the southeast, but for want of more extended observations their final direction after passing off the coast, remains as yet undetermined.

During the month of August, 1873, twelve areas of low barometer have been traced on the tri-daily weather maps, and the tracks pursued by the centres of these areas, with explanatory notes, are represented on map No. 2. Track No. 2 may be found on the map accompanying the Weather Review of July.

These areas of low barometer were, with one exception, first observed either in the territories of the United States east of the Rocky Mountains or in Manitoba; and by referring to map No. 3, it will be found that this region is one of mean low barometer for the month. Seven of these areas passed eastward to the Atlantic coast within the limits of our stations, with a mean latitude of 43° .

The remaining areas passed to the northeastward into British America without any decided atmospheric disturbance in the United States.

STORMS.

The areas of low barometer traced on map No. 2, were accompanied with slight disturbance while in the western portion of the United States, but no marked change in the weather occurred until the eleventh of the month, when the area of low barometer marked No. 6, was first observed in Kansas.

This storm moved slowly to the eastward, with cloudy weather, rain, and light to fresh winds, the winds increasing in force as the centre approached the Atlantic coast, and finally producing the northeasterly gale which occurred on the middle Atlantic and New England coast on the 14th and 15th. For this storm cautionary signals were displayed at Cape May, New York, New London, Wood's Hole, Boston, Portland and Eastport.

The second storm, and by far the most severe one that has occurred since the establishment of the Signal Service, is traced as No. 10 on map No. 2. Although this storm did not occur within the limits of our stations, there were indications of some atmospheric disturbance off the middle Atlantic coast on the 23d which warranted the prediction made in the probabilities written from the afternoon report of that date, viz., "For the New England and middle Atlantic coast, threatening weather," and from the midnight report of the same date, "For the New England and middle Atlantic coast stormy weather," with cautionary signals at Cape May, New York and New London.

This storm in consequence of its severity, is one of unusual interest, and the course marked for it may vary from the actual, which cannot be determined until additional data has been obtained, when a complete and accurate description will be published by this office.

The third decided storm of the month was first observed as an area of low barometer in the western portion of Kansas on the 29th at 11 P. M. This area moved to the eastward over the Lake region without any marked disturbance until the night of the 31st, when brisk and high winds, with areas of rain were reported. On the morning of the 1st of September, it had become unusually well defined in the Lower Lake region, after which it passed over northern New England and off the Atlantic coast with increasing force, finally producing a violent storm since reported from vessels which were in the North Atlantic on the 2d and 3rd of September.

WINDS.

Apart from the storms above referred to, no winds of special severity have been reported, except from Dubuque, Iowa. At this station a violent tornado occurred on the 7th, which although entirely local in its nature, developed an unusual force and caused great destruction of property. Owing to the carrying away and destruction of the anemometer at this station no recorded velocity of this wind has been obtained.

The unusual velocity of one hundred miles per hour was reported from Mt. Washington, N. H., during the storm of the 16th. The force developed by this wind has not been equalled at any other station since the establishment of the Signal Service.

The direction of the prevailing winds of the several stations are indicated by the arrows on the Map No. 3, and in comparing these directions with the isobarometric lines on the same map, it will be observed that they incline toward the area of mean low barometer.

RAIN-FALL.

The total quantity of rain during the month, as deduced from the reports of the several geographical sections, is given in the accompanying table on Map No. 4. In the Middle Atlantic States and in Minnesota there has been a decided excess over the mean rain-fall as calculated from observations of previous years; while there has been about the usual amount in the South Atlantic and Eastern Gulf States; in the remaining districts there has been a deficiency. In the table referred to the quantity of rain given has been deduced by taking the general average of the reported rain-fall from the several stations in each district. The general distribution of the rain-fall, as deduced from the reports received at this office and presented in the table above referred to, is graphically represented on Map No. 4.

TEMPERATURE.

In New England, the Middle States and thence westward over the Lower Lake region and adjoining States the mean temperature has been from two to five degrees below the normal, and about three degrees above the normal in the Upper Lake region, the upper Mississippi and lower Missouri valleys, but in the districts last named the temperature has been lower than reported for August, 1872. The results of the observations for the month are given in the accompanying table, in which is noted the comparison of the temperature of the several districts, with the mean temperature deduced from observations of previous years. The isothermal lines for the month, given on Map No. 3, indicate the general distribution of temperature throughout the United States.

RIVER AND OCEAN TEMPERATURES.

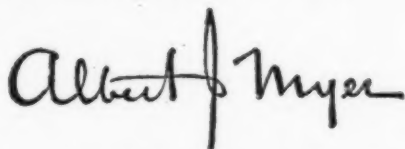
The number of stations supplied with the necessary apparatus for determining the temperature of water has been greatly increased, and the observations which were commenced during July have been continued and promise to be of general meteorological interest.

The table given on Map No. 3, presents a general synopsis of these observations. The temperature noted is that of the lowest stratum of water at the place of observation.

RIVER OBSERVATIONS.

In general these observations show that the rivers draining the eastern slope of the Rocky Mountains, were steadily falling during the entire month; and that those draining the western slope of the Appalachian range, experienced fluctuations attending the rains of these districts. The table on map No. 3, presents these observations in a consolidated form.

PUBLISHED BY ORDER OF THE SECRETARY OF WAR.



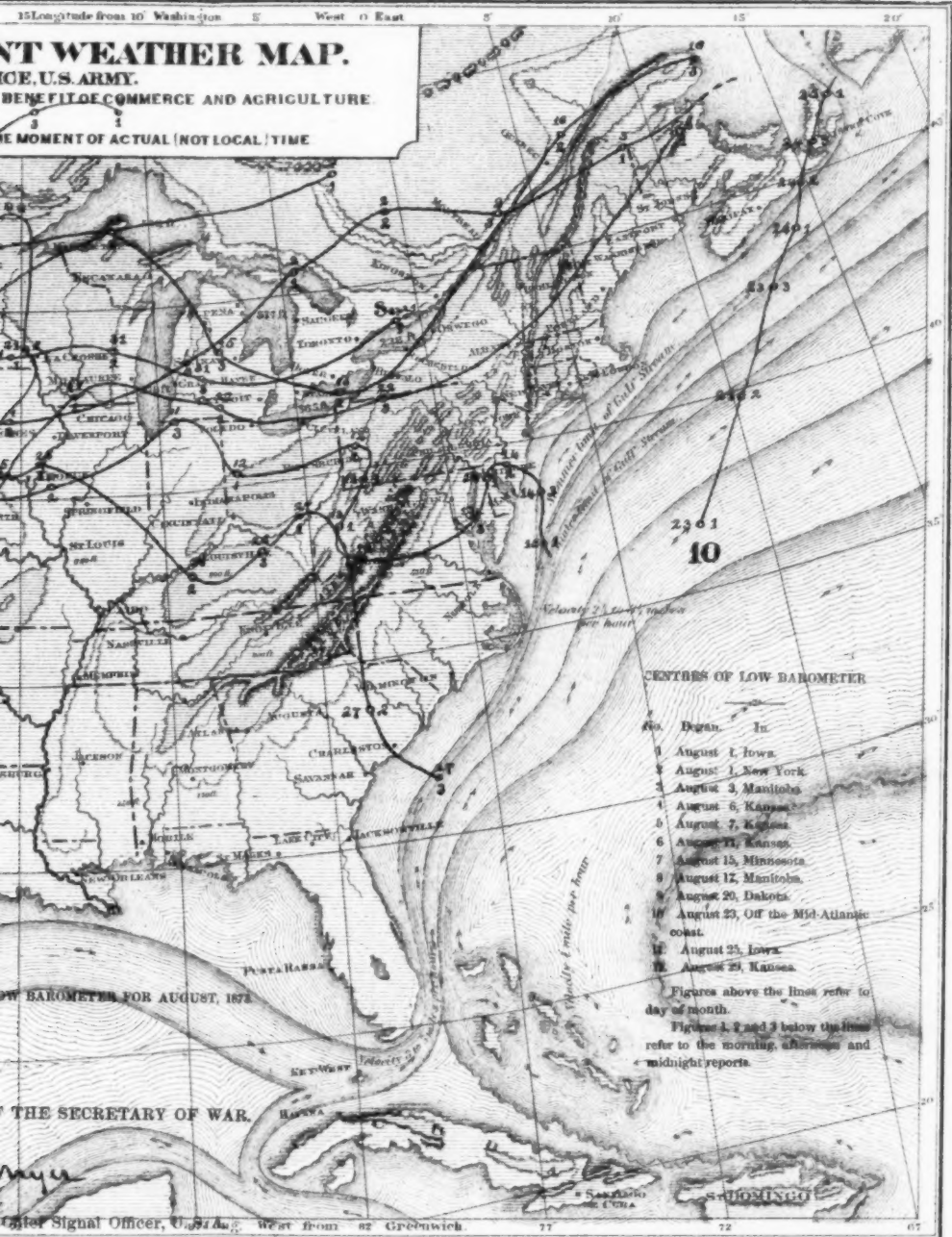
Brig. Gen. (Bvt. Assg'd,) Chief Signal Officer, U. S. A.

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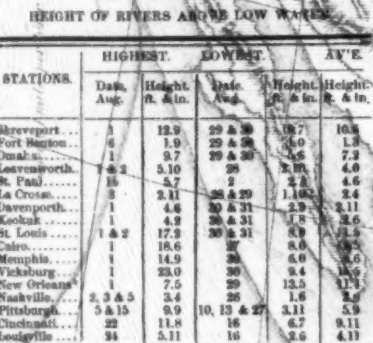








SIGNAL SERVICE, U.S. ARMY
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF
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*Below high water mark.

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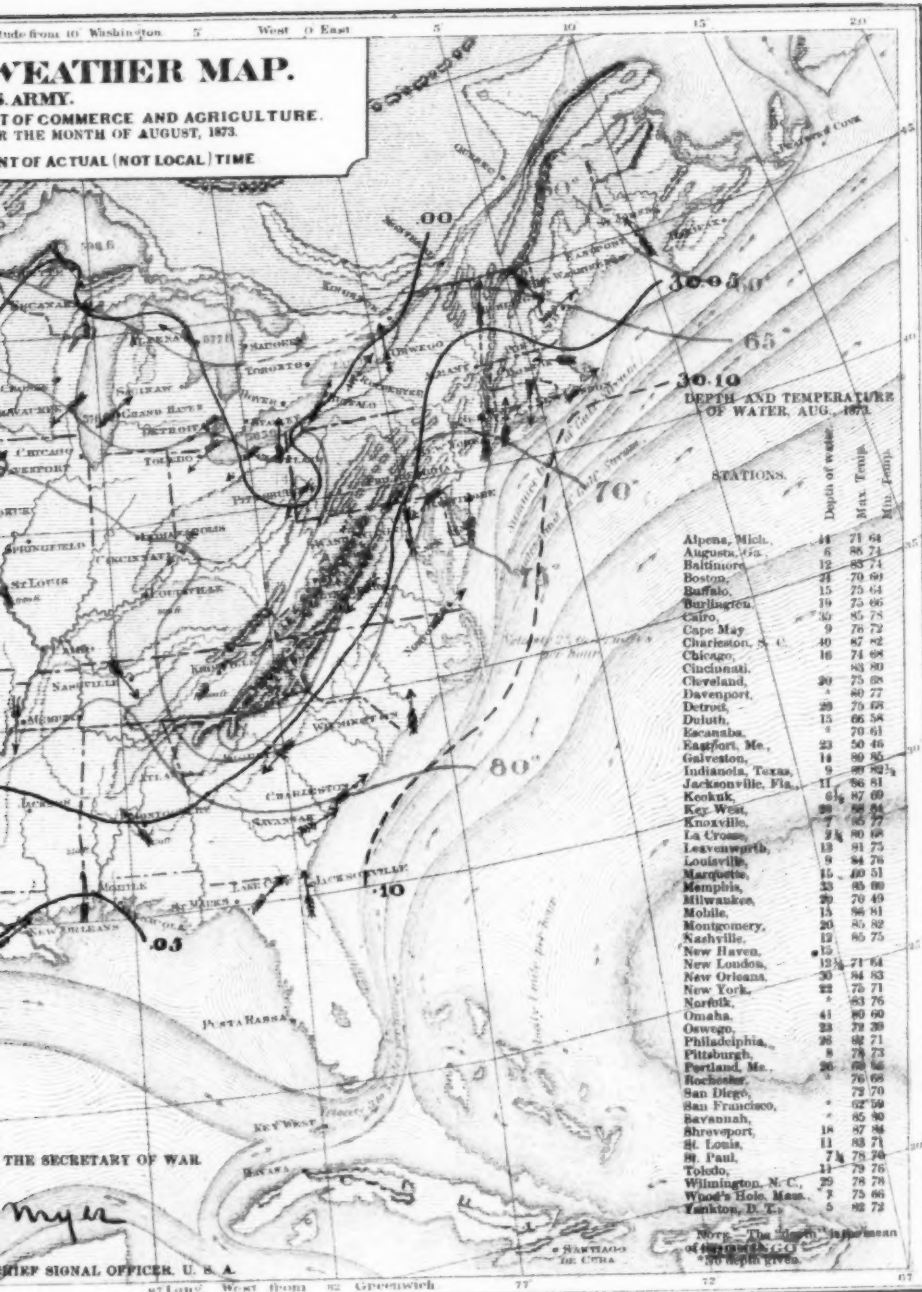
Albert J. M.

BRIG. GEN. (BYT. ASSG'D) CHIEF

Scale from 10° Washington 5° West 0 East 5° 10° 15° 20°

WEATHER MAP.

U. S. ARMY.
DEPT. OF COMMERCE AND AGRICULTURE.
FOR THE MONTH OF AUGUST, 1873.
STATE OF ACTUAL (NOT LOCAL) TIME



DEPTH AND TEMPERATURE OF WATER, AUG. 1873.

STATIONS.	Depth of water.	Max. Temp.	Min. Temp.
Alpena, Mich.	44	71	64
Augusta, Ga.	6	88	74
Baltimore	12	85	74
Boston	21	70	69
Buffalo	15	75	64
Burlington	19	75	66
Cairo	30	85	78
Cape May	9	76	72
Charleston, S. C.	40	87	82
Chicago	16	74	68
Cincinnati	18	83	80
Cleveland	20	75	68
Davenport	2	80	77
Detroit	29	75	64
Duluth	13	66	54
Esanaba	1	70	61
Essexford, Me.	23	50	46
Galveston	14	80	80
Indianola, Texas	9	89	82
Jacksonville, Fla.	11	86	81
Kearuk	61	87	80
Key West	29	86	84
Knoxville	7	85	77
La Crosse	24	80	68
Leavenworth	13	81	75
Louisville	9	84	76
Marquette	15	80	61
Memphis	23	85	80
Milwaukee	20	70	49
Moline	15	86	81
Montgomery	20	85	82
Nashville	12	85	75
New Haven	15	81	75
New London	12	71	64
New Orleans	30	84	83
New York	22	76	71
Norfolk	1	83	76
Omaha	41	80	60
Oswego	23	79	29
Philadelphia	26	82	71
Pittsburgh	8	78	73
Portland, Me.	26	80	66
Rochester	1	76	68
San Diego	72	70	70
San Francisco	1	82	59
Savannah	1	85	80
Shreveport	14	87	86
St. Louis	11	88	74
St. Paul	71	78	74
Toledo	11	79	76
Wilmington, N. C.	29	78	78
Wood's Hole, Mass.	3	75	66
Yankton, D. T.	5	88	72

RAIN CHART FOR THE MONTH OF _____

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4.0 or a deficiency
8.0 or an excess
6.0 or a deficiency
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6.0 or an excess

Longitude from Washington 5 West to East 10 15 20 25 30

WEATHER MAP.
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 BENEFIT OF COMMERCE AND AGRICULTURE.
 MONTH OF AUGUST 1873



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MONTHLY WEATHER-REVIEW, SEPTEMBER, 1873.

STORMS.

During this month eleven low barometers have crossed the country east of the Rocky Mountains. Map No. 1 shows, approximately, the paths of their centers which have passed over the lake region in a northeastward or eastward course, excepting the two on the South Atlantic coast. Several of them were remarkably severe over the upper lakes, and destructive to shipping.

That of August 30, 31, and September 1, was accompanied by occasional rain and brisk winds over the Northwest, Ohio Valley, lake region, Middle States, and New England, the winds increasing to high from Michigan eastward over the lower lakes and Saint Lawrence Valley.

September 2, 3, 4, and 5, by brisk and occasionally high winds and rain from the Northwest eastward over the lake region, Ohio Valley, Middle States, and New England. A hurricane was reported as having lasted about one hour on Lake Michigan, and tornadoes in Massachusetts on the 4th; very severe thunder-storms, with high winds in Eastern Tennessee on the 3d, and Southeastern North Carolina on the 5th.

September 11, 12, and 13, by rain at nearly all of the stations east of the Rocky Mountains; brisk and high winds over the Northwest and upper lakes; severe "norther" in Texas on the 13th; heavy snow on Mount Washington on the night of the 14th.

September 14, 15, and 16, by high south and west winds over the Northwest and upper lakes; occasional rain over Minnesota, the lake region, and New England.

September 17, 18, and 19, by high winds over the Northwest, lakes, and Saint Lawrence Valley; by rain from the Northwest eastward over the lakes, Ohio and Saint Lawrence Valleys, Middle States, and New England.

September 18, 19, and 20, by brisk and high winds and heavy rain from Florida to Southeastern Virginia, having been very severe on the coast.

September 22 and 23, by brisk winds and heavy rains on the South Atlantic coast.

September 23 and 24, by high winds over the Northwest and lakes; rains from the Missouri and Ohio Valleys to the lakes and Middle and East Atlantic coast. This was the severest storm of the month, especially on the upper lakes, whence very heavy gales were reported.

September 25 and 26, by high winds over the Northwest and upper lakes, with occasional rain; light snow in Montana on the 26th; heavy gales on the upper lakes.

September 27, 28, and 29, by high winds on Lake Ontario and the lower Saint Lawrence Valley; rain in all sections east of the Rocky Mountains, except the east Gulf States; followed by a severe "norther" in Texas during the night of the 29th and the morning of the 30th, and by light snow from Northern Minnesota and Dakota northward.

On the 7th, 8th, and 9th, an area of high barometer extended itself eastward over the Northwest, lake region, Ohio Valley, Middle States, and New England, with falling temperature, and with light frost over the Northwest and upper lake region.

13, 14, and 15.—A second, over the same region with quite heavy frost, which was very severe on the morning of the 13th over Dakota, Minn., and the northern portion of the upper lake region.

16 and 17.—A third over the Northwest, lakes, Middle States, and New England, with frost over the northern portions of these sections.

September 19, 20, and 21.—A fourth, from the Northwest over the lakes, Ohio Valley, Middle States, and New England, with frost, except probably on the immediate coast.

September 29 and 30.—A fifth, from the Northwest south and east over the entire country, with low temperature, producing frost over the northern sections.

TEMPERATURE.

On map No. 2 will be found a table of the average mean temperature for the different districts for this month. For New England, the South Atlantic States, the Ohio Valley, and Tennessee, it is the same as that for many years. For the Middle Atlantic and Gulf States, and the lower lake region, the former is the greater, from $0^{\circ}.4$ to $0^{\circ}.6$. For the upper lake region, Minnesota, and Upper Mississippi and Lower Missouri Valleys, it is less, from $1^{\circ}.2$ to $2^{\circ}.5$. Compared with the average for the same month of last year, the former is the lower for the stations in all of the districts, except the South Atlantic States, Tennessee, and the Ohio Valley, where it varies slightly above and below the latter.

RAIN-FALL.

Map No. 3 gives, approximately, the rain-fall for the various districts east of the Rocky Mountains. A table upon the same shows where there has been the average fall, excess, or deficiency.

RIVERS.

The observations show that the Missouri, Red, Mississippi, and Ohio Rivers fell quite steadily during the month, excepting slight oscillations in the head-waters of the two latter, produced by rains. The Cumberland fluctuated more or less, having been lower October 1 than September 1. Upon map No. 3 will be found a table which explains itself.

Sixty-one cautionary signals were ordered to be displayed at our own stations during the month for seven storms, and the majority of them on the lakes. Thirty Canadian stations were warned of the approach of storms.

PAPER 27.

Special Orders }
No. 78. }

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
Washington, D. C., June 14, 1871.

Sergeant Frederick Meyer, observer, Signal-Service, U. S. A., will proceed without delay to New York City, and report to Captain C. F. Hall, commander of the North Polar Expedition, for duty in connection with that expedition. He will, in addition to the performance of duty under the orders of Captain Hall, carry out the written instructions received from this office.

The Quartermaster's Department will furnish the necessary transportation.

By order of the Chief Signal-Officer of the Army,

GARRICK MALLERY,

Capt. and Bt. Lieut. Col., U. S. A., Acting Signal-Officer and Assistant.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND
AGRICULTURE,

Washington, D. C., June 12, 1871.

SERGEANT: The Chief Signal-Officer directs that you will take daily observations during your entire expedition at 7.35 a. m., 4.35 p. m., and 11.35 p. m., Washington mean time, of the barometer, thermometer, wind, and weather, and such additional meteorological observations as are compatible with the duties assigned you by Captain Hall.

Among these additional observations, you will particularly bear in mind the following:

1. Frequent observations of the barometer, wind, and weather at hours intermediate to the above.
2. Regular observations of the minimum and maximum thermometers.
3. Velocity of wind at sea, especially in gales, and made with numerous anemometers in different positions.
4. Forms and motions of clouds, and meteor-tracks.
5. Ozone.
6. Electrical and auroral phenomena.
7. Solar and terrestrial radiation thermometers.
8. Forms, &c., of snow-crystals.
9. Heights of twilight arcs—noting the time very exactly.
10. Dew-point at very low temperatures.
11. Spectrum-lines or bands in the aurora and the atmosphere.
12. Polarization of atmospheric light and position of neutral points.
13. Rain and snow fall at different altitudes.
14. Temperatures of sea and rivers and springs, and the earth and snow at depths of 3, 6, 12, 24, and 36 inches.
15. Habits of plants and animals as affected by climate.

You will take special care to make accurate comparisons of your barometer, &c., with other instruments that you may find at points on your journey, that have been used for meteorological observations.

You will keep all the records for any period as far as possible in one and the same book; dividing it into two portions, one for the systematic observations at regular hours, the other for occasional observations.

You will keep a duplicate record of the systematic and more important occasional observations on Form 4, and forward the same to this office as often as occasion may offer.

Very respectfully,

H. W. HOWGATE,

Second Lieut. and Bvt. Capt., U. S. A., Acting Signal-Officer and Assistant.

Sergeant F. MEYER,

Observer, Signal-Service, U. S. A.

SERGEANT FREDERICK MEYER'S REPORT ON THE NORTH POLAR EXPEDITION, 1871-'73.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL-OFFICER,

Washington, D. C., July 1, 1873.

GENERAL: I have the honor to inclose a report of my proceedings while in connection with the North Polar Expedition, which, by Special Order No. 78, I was ordered to accompany. All items and data of this report are from memory, and not based upon notes taken at the time of their occurrence, with the exception of a few observations for geographical position, and general outline of adventures while living on the ice.

The report naturally arranges itself under the two general headings—

- I. History of the expedition.
- II. Scientific operations of the expedition.

Heading II, according to the instructions of the National Academy of Sciences, consists of—

1. Astronomical observations.
2. Magnetic observations.
3. Observations on the force of gravity
4. Observations on ocean physics.

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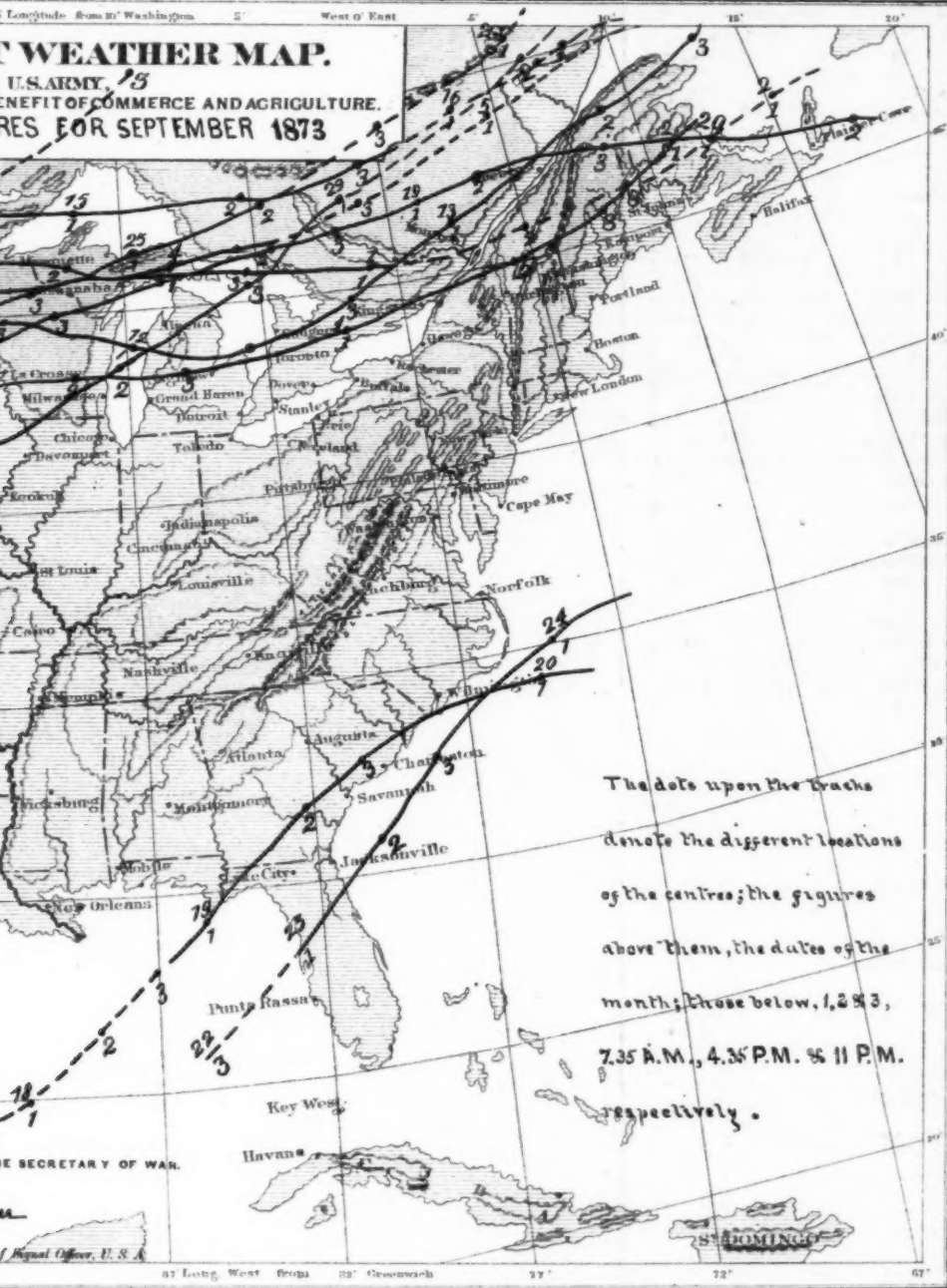
SIGNAL SERVICE U.S.
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT
TRACKS OF STORM-CENTRES

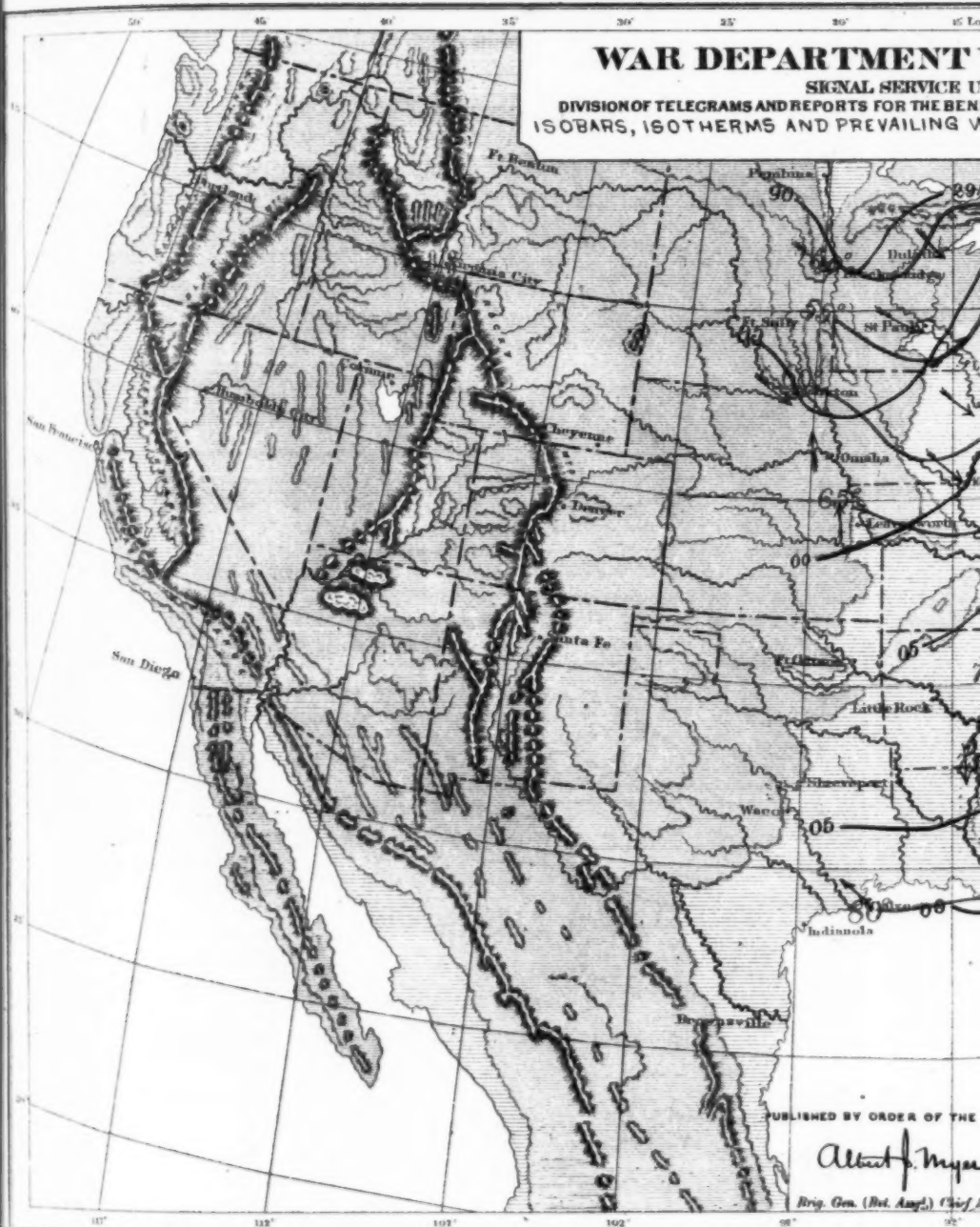


Longitude from 10° Washington 2° West of East 5° 10° 15° 20°

WEATHER MAP.

U.S. ARMY, 13
BENEFIT OF COMMERCE AND AGRICULTURE.
RES FOR SEPTEMBER 1873





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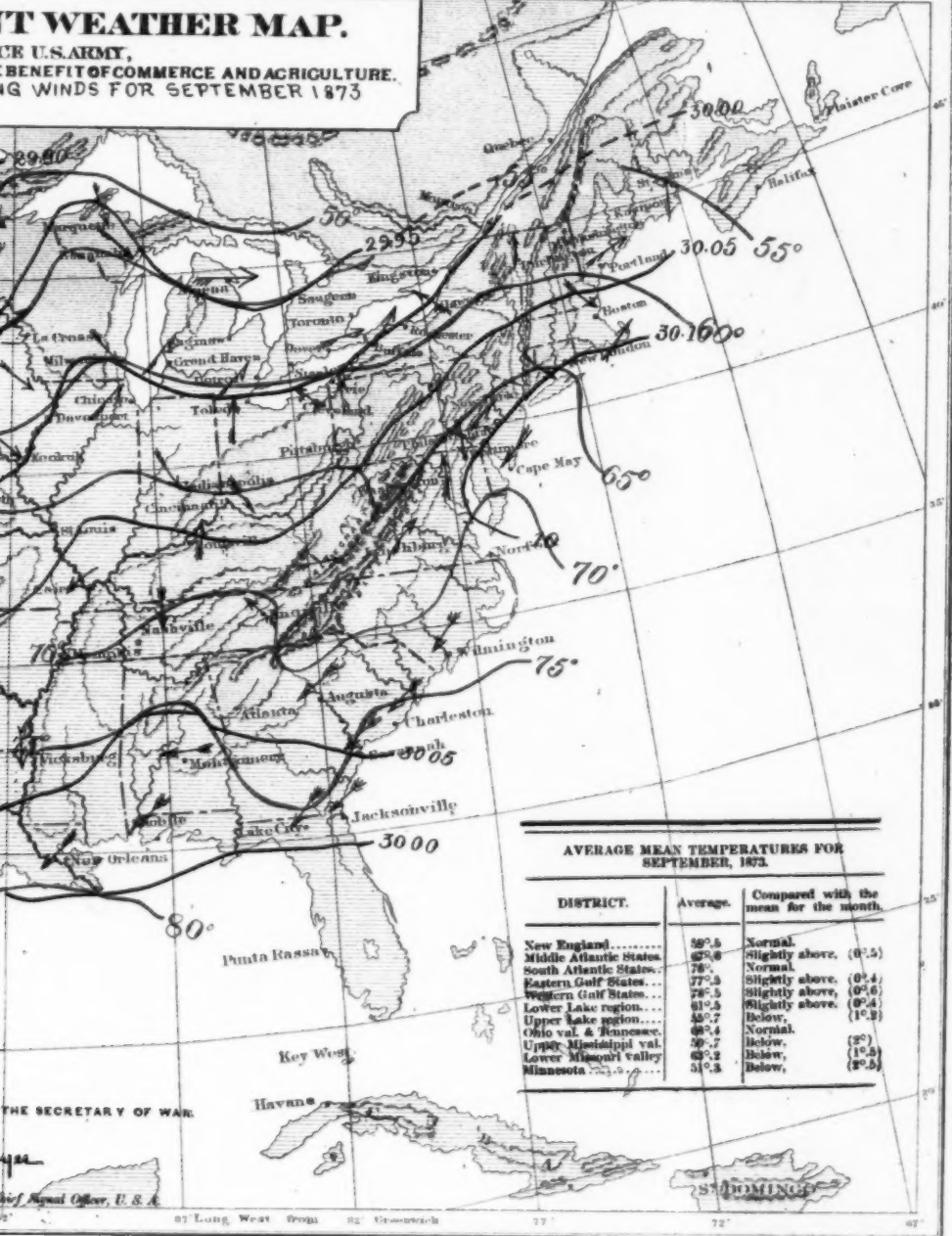
Albert J. Meyer

Brig. Gen. (Ret. Asst.) Chief

15 Longitude. From W. Washington 5° West of East 10° 15° 20°

WEATHER MAP.

U. S. ARMY,
FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.
SHOWING WINDS FOR SEPTEMBER 1873

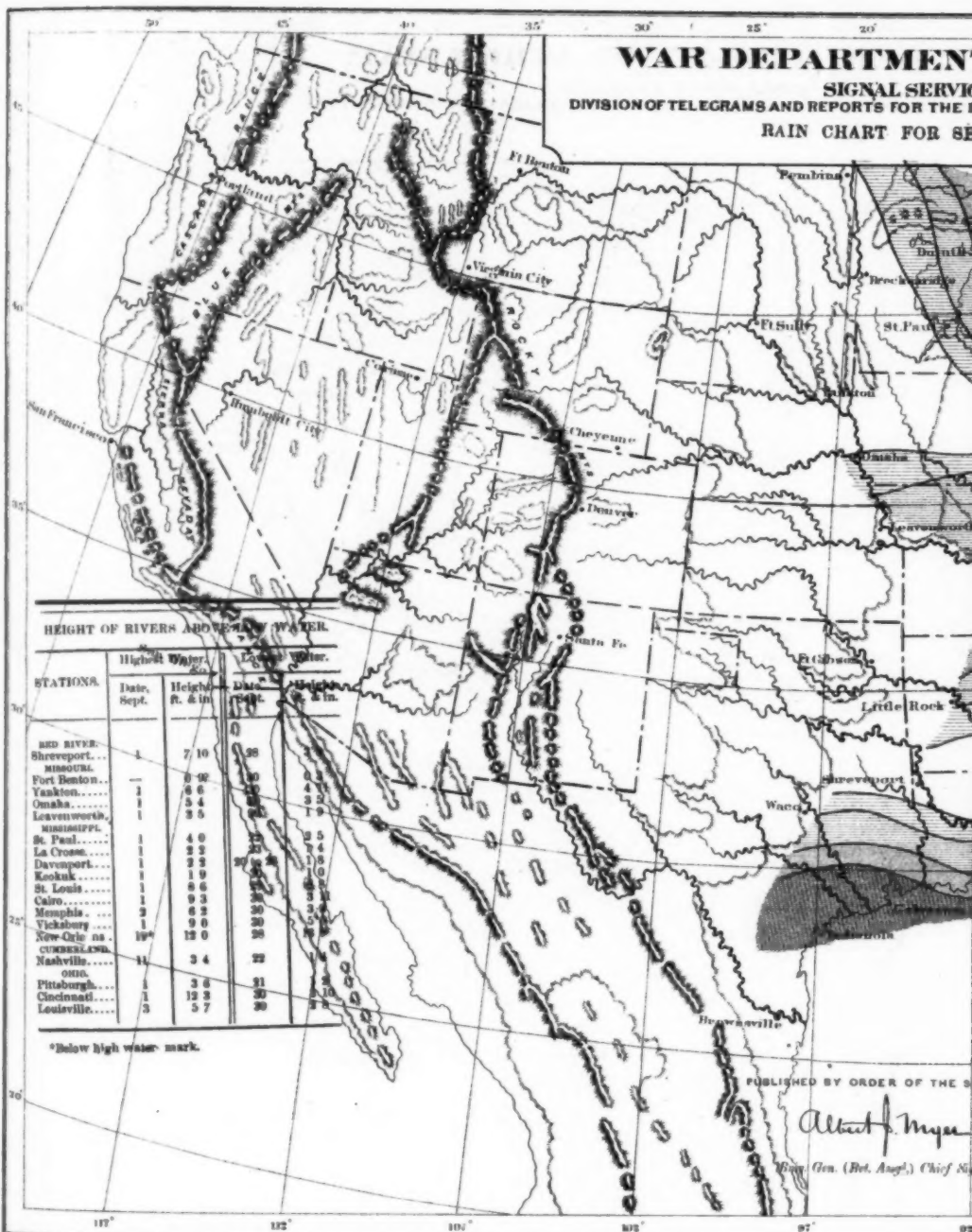


THE SECRETARY OF WAR.

Chief Signal Officer, U. S. A.

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WAR DEPARTMENT
SIGNAL SERVICE
 DIVISION OF TELEGRAMS AND REPORTS FOR THE
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15° Longitude from W. Washington 5° West of East 5° 10° 15° 20°

PRESENT WEATHER MAP.

SERVICE, U.S. ARMY.
FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.
SEPTEMBER, 1873.

